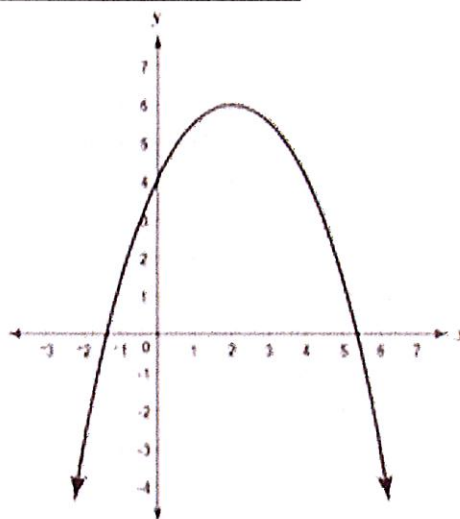


Name: Solutions

1. Shown is the graph of $y = g(x)$



1. Evaluate:

a. $g(5) = 1$
approximately

b. $g(2) = 6$

c. $g(-2) = -2\frac{1}{2}$
approximately

2. Write the domain and range of the function using interval notation.

$D: (-\infty, \infty)$ $R: (-\infty, 6]$

3. State the interval(s) on which the function is:

a. increasing

$(-\infty, 2)$

b. decreasing

$(2, \infty)$

c. constant

None

4. State the interval(s) for which:

a. $g(x) > 0$

$(-1\frac{1}{2}, 5\frac{1}{2})$

b. $g(x) < 0$

$(-\infty, -1\frac{1}{2}) \cup (5\frac{1}{2}, \infty)$

5. State each value:

a. the maximum value of $y = g(x)$

$y = 6$

b. the minimum value of $y = g(x)$

None

6. Solve $g(x) = 4$, i.e. for what value(s) of x does $g(x) = 4$ hold true?

$x = 0$ $x = 4$

7. State the coordinates of each (approximate if necessary):

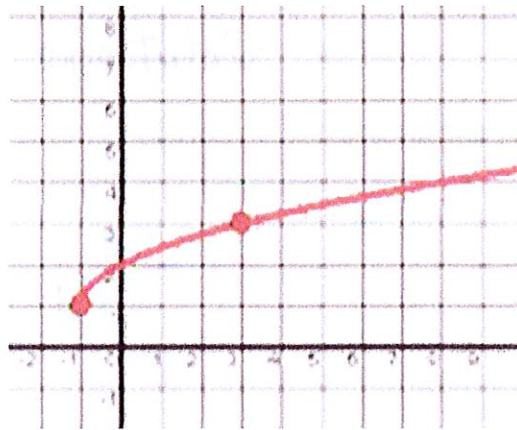
a. any x-intercepts

~~None~~ $(-1\frac{1}{2}, 0)$ & $(5\frac{1}{2}, 0)$

b. the y-intercept

$(0, 4)$

2. Shown is the graph of $y = f(x)$



1. Evaluate:

a. $f(0) = 2$

b. $f(-1) = 1$

c. $f(8) = 4$

2. Write the domain and range of the function using interval notation.

$D: [-1, \infty)$

$R: [1, \infty)$

3. State the interval(s) on which the function is:

a. increasing

$[-1, \infty)$

b. decreasing

~~None~~ None

c. constant

None

4. State the interval(s) for which:

a. $f(x) > 0$

$[-1, \infty)$

b. $f(x) < 0$

None

5. State each value:

a. the maximum value of $y = f(x)$

None

b. the minimum value of $y = f(x)$

$y = 1$

6. Solve $f(x) = 1$, i.e. for what value(s) of x does $f(x) = 1$ hold true?

$x = -1$

7. State the coordinates of each:

a. any x -intercepts

None

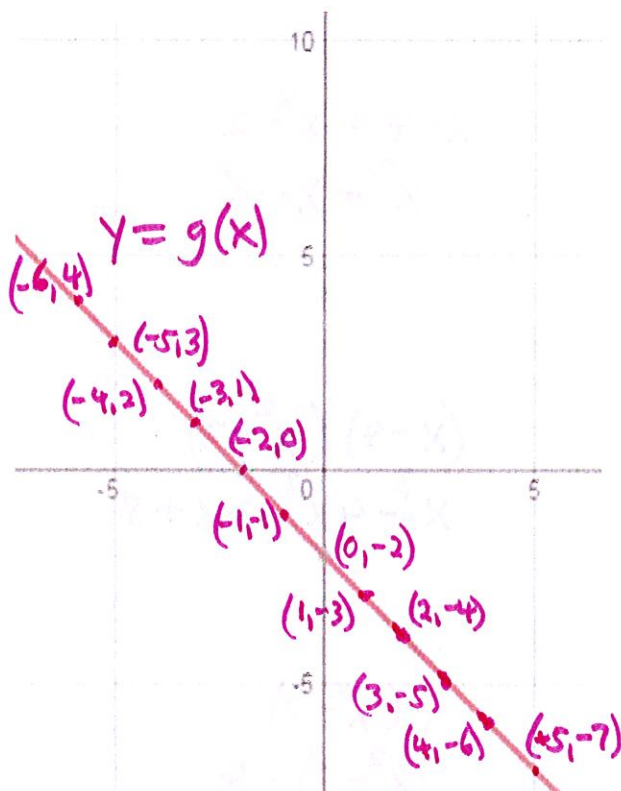
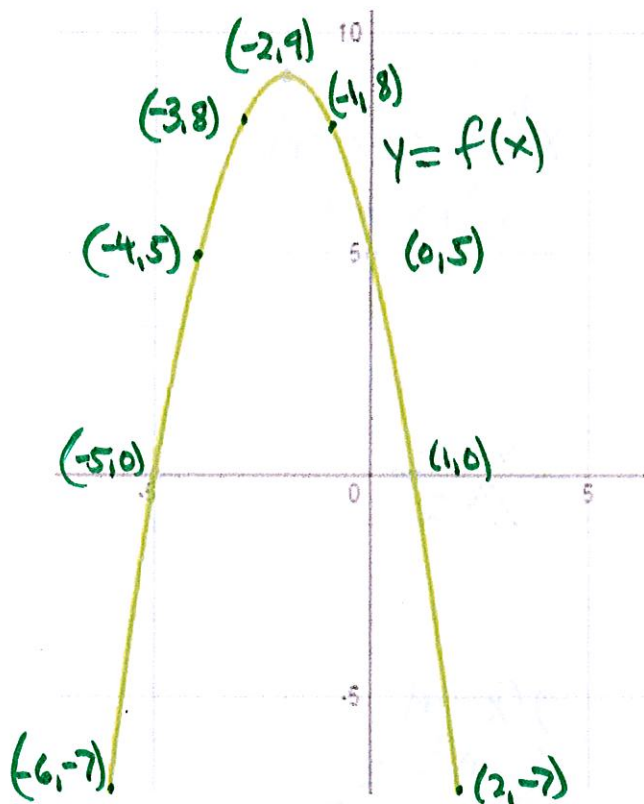
b. the y -intercept

$(0, 2)$

Given the two functions $f(x) = x - 4$ and $g(x) = x^2 - 2$:

<p>1. Evaluate $(f + g)(x)$</p> $x - 4 + x^2 - 2$ $x^2 + x - 6$	<p>2. Evaluate $(g - f)(x)$</p> $x^2 - 2 - (x - 4)$ $x^2 + x + 2$
<p>3. Evaluate $(fg)(x)$</p> $(x - 4)(x^2 - 2)$ $x^3 - 4x^2 - 2x + 8$	<p>4. Evaluate $\left(\frac{f}{g}\right)(x)$</p> $\frac{x - 4}{x^2 - 2}$
<p>5. Evaluate $f(g(x))$</p> $f(x^2 - 2)$ $(x^2 - 2) - 4$ $x^2 - 6$	<p>6. Evaluate $(g \circ f)(x)$</p> $g(x - 4)$ $(x - 4)^2 - 2$ $x^2 - 8x + 16 - 2$ $x^2 - 8x + 14$
<p>7. Evaluate $(f \circ f)(x)$</p> $f(x - 4)$ $(x - 4) - 4$ $x - 8$	<p>8. Evaluate $f(3) \cdot g(3)$</p> $(3 - 4)((3)^2 - 2)$ $(-1)(7)$ -7
<p>9. Evaluate $f(g(-1))$</p> $f((-1)^2 - 2)$ $f(-1)$ $-1 - 4$ -5	<p>10. Evaluate $(g \circ f)(8)$</p> $g(f(8))$ $g(8 - 4)$ $g(4)$ $4^2 - 2 = 14$
<p>11. State the domain and range of $f(g(x))$</p> <p>see #5 above</p> <p>Vertex $V(0, -6)$</p> <p>$D: (-\infty, \infty)$ $R: [-6, \infty)$</p>	<p>12. State the domain and range of $g(f(x))$</p> <p>see #6 above</p> <p>axis $x = -\frac{(-8)}{2(1)} = 4$</p> $y = (4)^2 - 8(4) + 14 = 16 - 32 + 14 = -2$ <p>$V(4, -2)$</p> <p>$D: (-\infty, \infty)$ $R: [-2, \infty)$</p>

Use the graphs of $y = f(x)$ on the left and $y = g(x)$ on the right below to answer # 13 - 22



13. Evaluate $(f + g)(0) = f(0) + g(0)$ $= 5 + -2$ $= 3$	14. Evaluate $(g \circ f)(0) = g(f(0))$ $= g(5)$ $= -7$
15. Evaluate $f(-1) - g(-1)$ $8 - -1$ 9	16. Evaluate $(f \circ g)(-4) = f(g(-4))$ $= f(2)$ $= -7$
17. Evaluate $f(g(-2))$ $f(0)$ 5	18. Evaluate $g(g(3))$ $g(-5)$ 3
19. Evaluate $f(-3) \cdot g(-3)$ $8 \cdot 1$ 8	20. Evaluate $f(0) \cdot g(0)$ $5 \cdot -2$ -10
21. Evaluate $\left(\frac{f}{g}\right)(1) = \frac{f(1)}{g(1)} = \frac{0}{-3} = 0$	22. Evaluate $(g - f)(-2) = g(-2) - f(-2)$ $-2 - 9$ -11